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The mutation theory

In 1901 the first volume of DEVRIES'S *Mutationstheorie* was published, and was reviewed in this journal.² It put the doctrine of evolution upon an experimental basis and has been the stimulus of a large amount of important investigation. Such a contribution to biology is of the first order, whether the theory of mutation proves to be a general explanation of the origin of species or not. It has been unfortunate that many who are interested in evolution, even investigators, have not understood fully the theory of mutation, because they know of it only from condensed statements or reviews. This applies to all who do not read German or who do not read it with facility. This condition has now been remedied by the appearance of an English translation³ of this great work. It is possible now for all English-reading biologists to judge of the theory from the full presentation by its author, and to substitute knowledge for superficial familiarity.

The full review of the original volume by this journal makes it necessary only to announce the appearance of the translation. And yet, eight years have elapsed since the theory was formally proposed and much could be said of its standing and influence. During the same period DEVRIES has twice visited the United States, and by conversation and lecture and personality has impressed himself and his views in a peculiar way upon American biologists. His influence upon scientific plant and animal breeding in this country has been very great, and the general result has been an increasing conviction that his views and his example have advanced biological science immensely.

The thesis of this first volume, as its author states, is the promulgation of the principle of unit characters. At the time of its announcement in 1900 this view was in opposition to the current belief; but the author is convinced that it has now gained almost universal acceptance. This conception that "the attributes of organisms consist of distinct, separate, and independent units" was derived chiefly from three sources: (1) an analysis of the processes of selection in practical plant breeding; (2) the experimental evidence afforded by Oenothera; and (3) Mendelism. This means that the origin of species by mutation is only one feature connected with the more fundamental conception of unit characters, and that a wide range of problems is opened up to experimental investigation. The only important change introduced into the translation is the incorporation of NILSSON'S results in the selection and improvement of cereals in Sweden.

The selection of translators could not have been more happy and effective; and the publishers are to be congratulated, not only for the worthy appearance of this book, but also for their real contribution to the advancement of knowledge in assuming the responsibility of publication.

² BOT. GAZETTE 33:236-239. 1902.

³ DEVRIES, HUGO, The mutation theory; experiments and observations on the origin of species in the vegetable kingdom. Translated by J. B. FARMER and A. D. DARBISHIRE. Vol. I. The origin of species by mutation. 8vo. pp. xv+582. colored pls. 6. figs. 119. Chicago: The Open Court Publishing Company. 1909. \$4.00.

The English translation will consist of two volumes, the second treating of the origin of varieties and also of the general problems of the origin of new forms. The second volume is announced to appear in April.—J. M. C.

MINOR NOTICES

Knuth's handbook.—The third volume of the English translation of KNUTH'S *Handbuch der Blütenbiologie* has just appeared⁴ and completes the work. The original volumes and the two preceding volumes of the translation were reviewed in this journal,⁵ so that the general scope and character of the work have been noted. The first volume is a general one, treating of the structure of flowers and of insects in relation to pollination. The second volume is a record of observations on flower pollination made in Europe and the arctic regions, arranged by natural orders and extending from "Ranunculaceae to Stylideae." The present volume continues the subject of the second and includes the natural orders from "Goodenoviae to Cycadeae." The encyclopedic character of the work may be judged by the fact that the second and third volumes contain observations on 1048 genera and 3112 species of plants. There is appended a systematic list of insect visitors recorded in these two volumes, arranged alphabetically and with the names of the plants visited, and the number of species reaches 2888.

Such a work cannot be reviewed, it can only be announced. The burden of translation must have been enormous, but it has introduced English-reading botanists to an immense body of facts, and may serve to stimulate work in this attractive field. The total cost of the three volumes (\$24.25 in cloth, and \$27.25 in half morocco) may seem somewhat prohibitive, but the work may be made available in libraries.—J. M. C.

A new laboratory guide.—The widespread interest in the teaching of botany in secondary schools is shown by the abundance of new textbooks and laboratory manuals. One of the latest of the latter is by CLUTE.⁶ It is divided into two parts; the first deals with the usual topics in connection with the structure and activities of angiosperms, and the latter with the great plant groups. Its most striking features seem to be the small number of exercises, each of which is very comprehensive; the large number of suggestive questions; and the useful set of definitions accompanying each exercise. The directions to the pupil are mainly contained in the questions, and these are very numerous (99 in one of the exercises). Complete answering of these would demand careful study of the material used,

⁴ KNUTH, PAUL, *Handbook of flower pollination, based upon HERMANN MÜLLER'S work "The fertilization of flowers by insects."* Translated by J. R. AINSWORTH DAVIS. Vol. III. 8vo. pp. iv+644. figs. 208. Oxford: Clarendon Press. 1909. Cloth \$8.75.

⁵ BOT. GAZETTE 28:280. 1899; 28:432. 1899; 42:494. 1906; 46:63. 1908.

⁶ CLUTE, WILLARD N., *Laboratory botany for the high school.* pp. xiv+177. Boston: Ginn & Co. 1909. 75 cents.